

Did Severe Rains and Flooding in May 2015 Affect Texas Poison Center Call Patterns?

Mathias Forrester

Epidemiologist

Texas Department of State Health
Services (DSHS)

mathias.forrester@dshs.state.tx.us

Background

May 2015: Texas experienced torrential rains and widespread flooding, particularly over Memorial Day weekend

- More than 37 trillion gallons of water fell on the state
- Statewide average of 8.81 inches
- Wettest single month on record in Texas
- Tornado activity in a number of areas
- Resulting death toll of at least 31

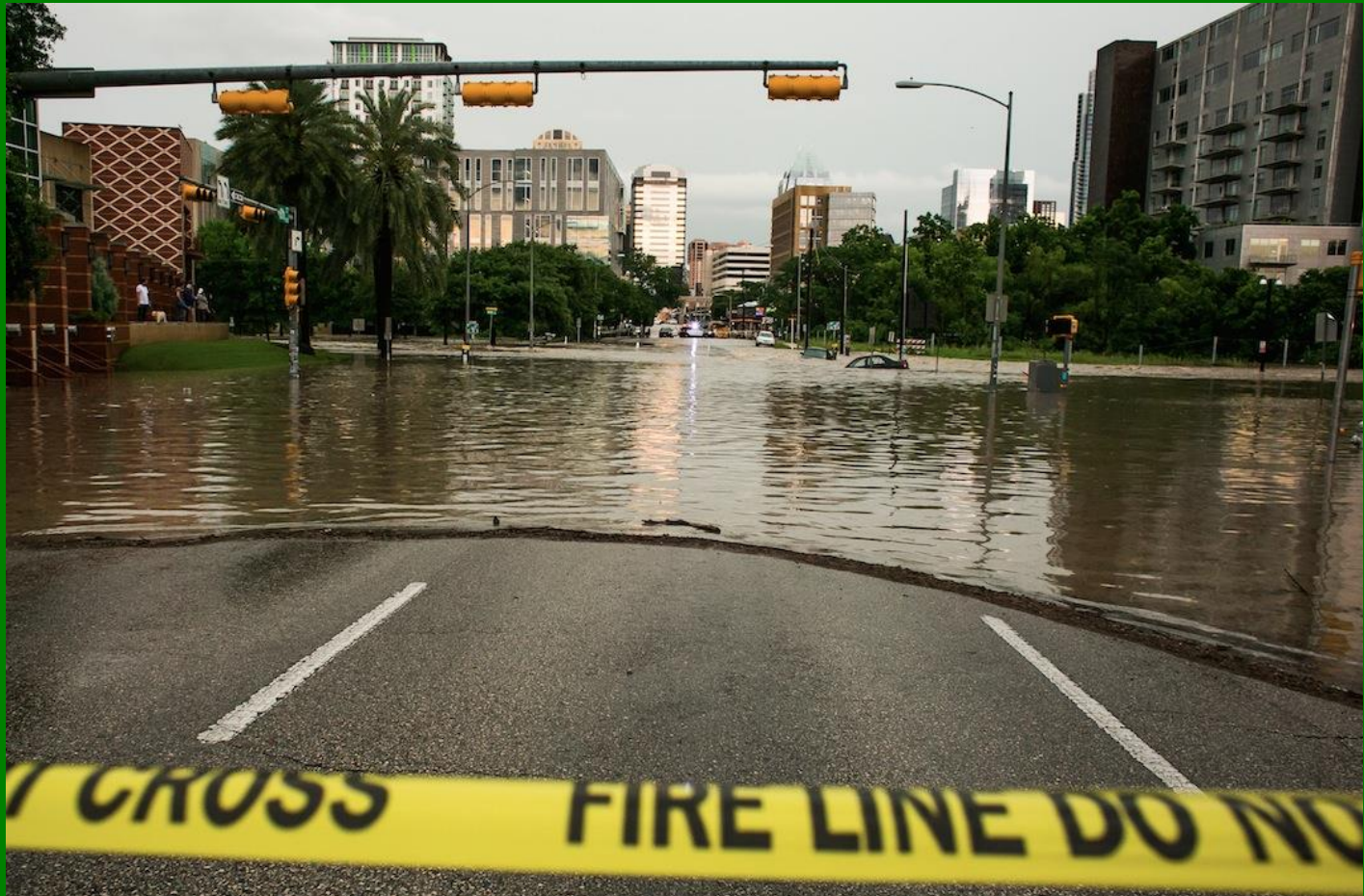
Background

Blanco River



Background

Austin



Background

Austin



Background

Austin



Background

Houston



Background

Dallas



Background

San Antonio

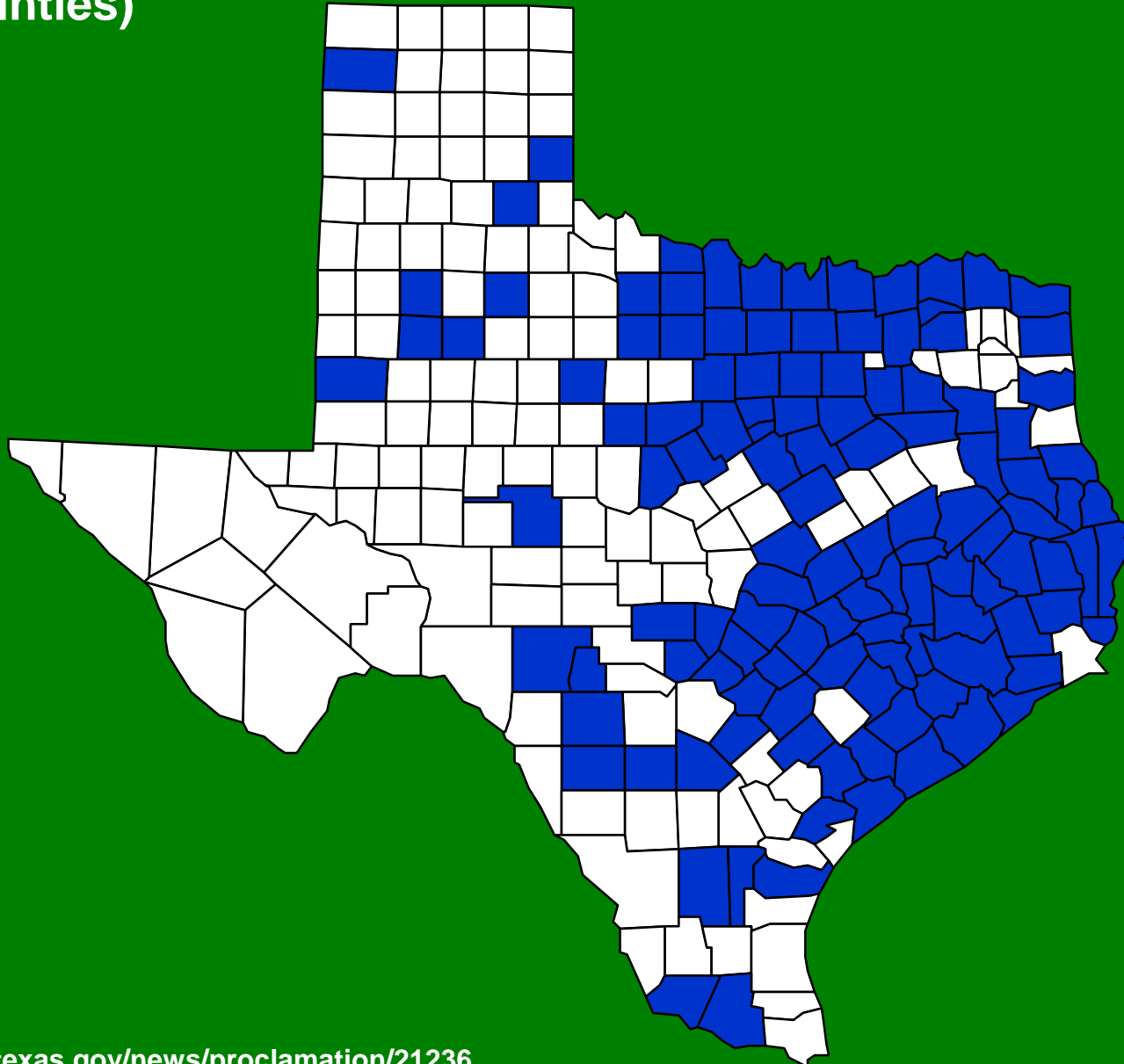


Background

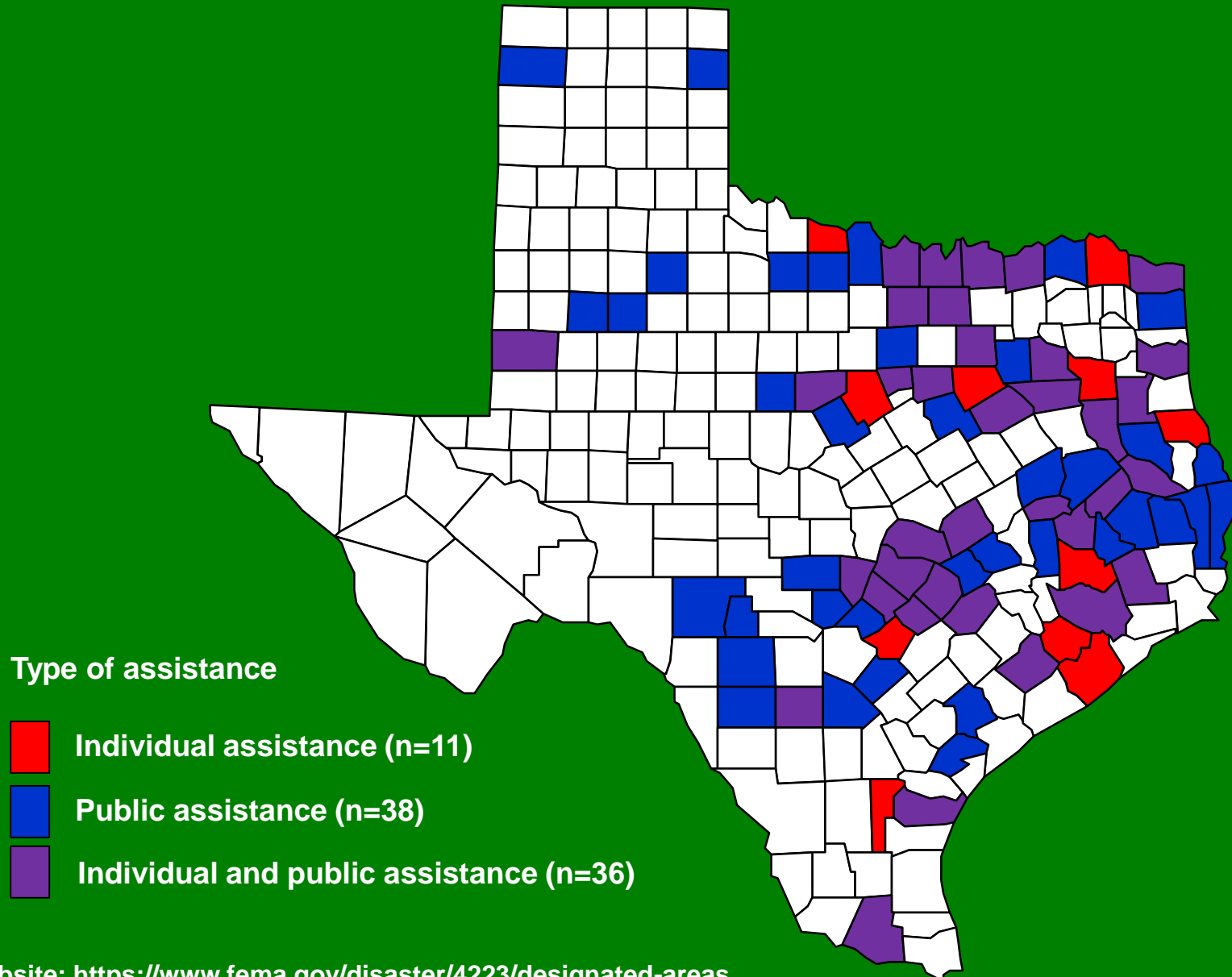
May 2015 serious rains and flooding

- As of July 22, 2015, Governor Greg Abbott declared a disaster in 121 Texas counties (77% of Texas population in 2010 Census)
- As of July 31, 2015, a federal disaster declaration had been made covering 85 counties (58% of Texas population in 2010 Census)

Texas counties declared a state of disaster in response to severe weather, tornado, and flooding that began on May 4, 2015, by Governor (n=121 counties)



Federal disaster declaration: Texas severe storms, tornadoes, straight-line winds, and flooding, May 4, 2015-June 22, 2015 (n=85 counties)

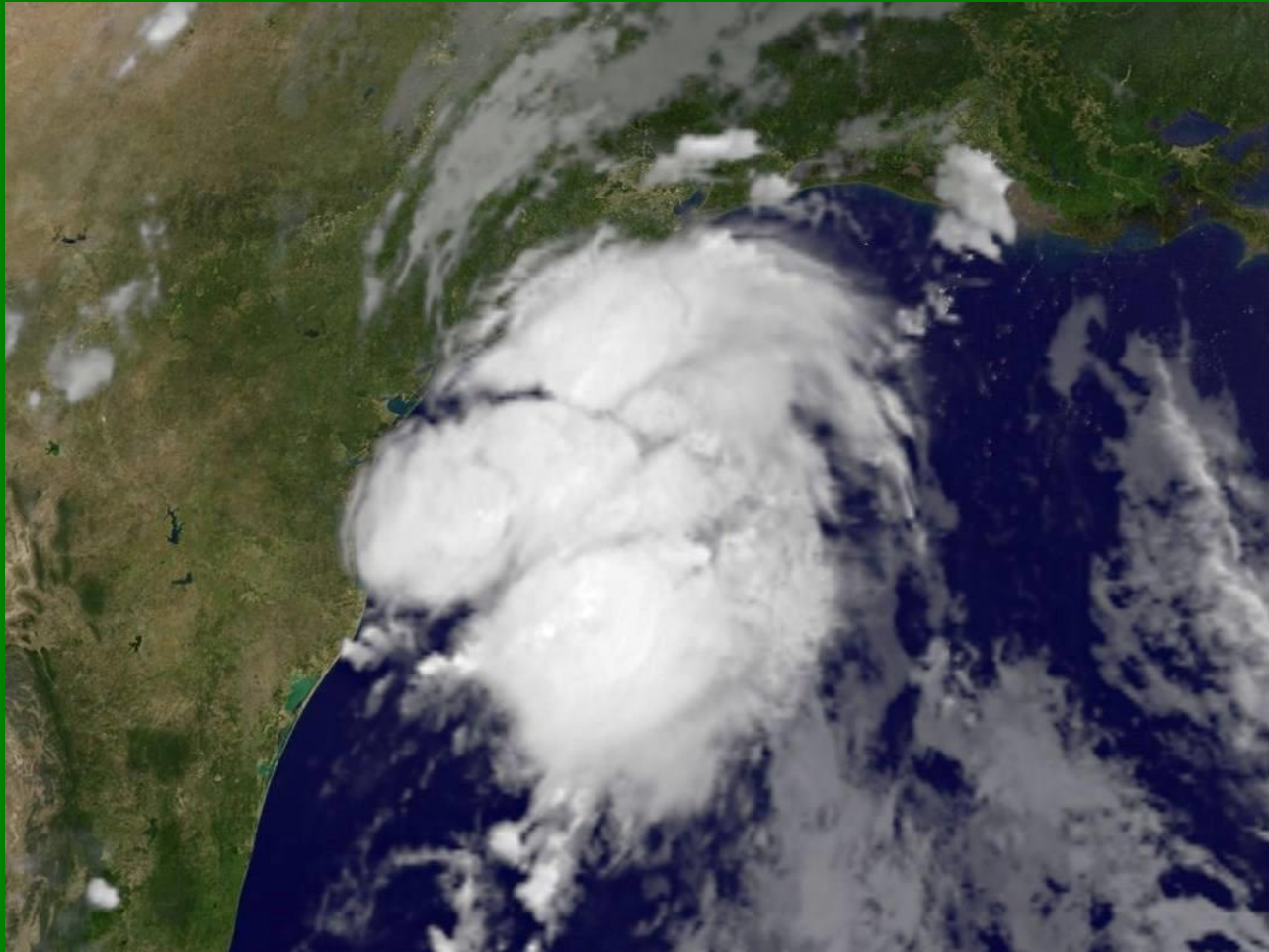


Background

On June 16, 2015, Tropic Storm Bill made landfall on Matagorda Island, Texas, at 11:45am CDT, bringing additional rainfall and flooding

Background

Tropical Storm Bill



Background

United States poison centers:

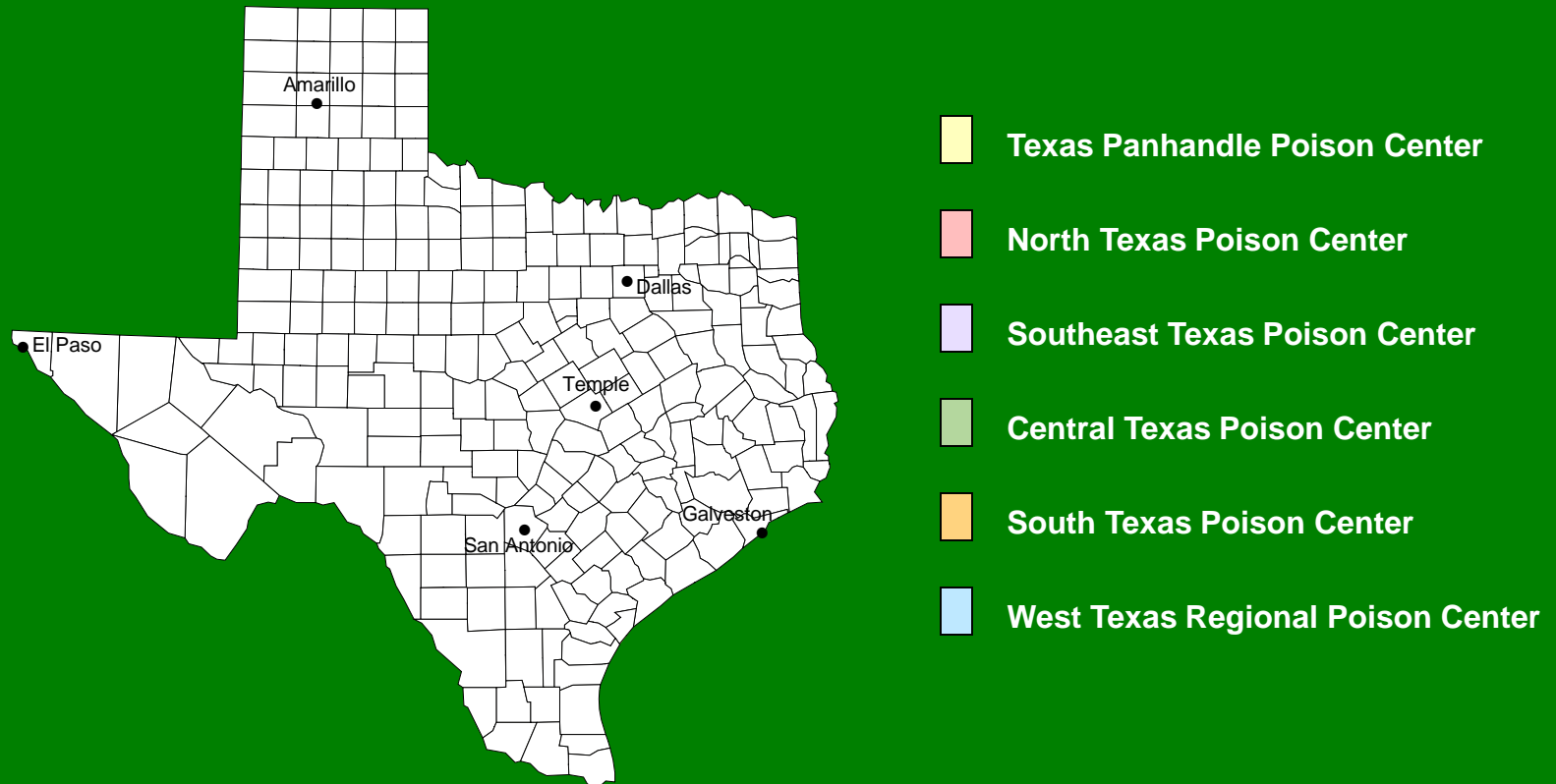
- Telephone consultation services: provide information on and assist in the management of potentially adverse exposures to various substances
- Available 24/7/365 (1-800-222-1222)
- Agents are trained nurses, pharmacists, other healthcare professionals

Background

Texas Poison Center Network (TPCN)

- 6 poison centers that service entire state
- Share a communications system so can answer one another's calls
- Share a single electronic database for collecting information on calls
- Database is replicated to DSHS daily

Location of 6 poison centers in the Texas Poison Center Network



Background

Poison centers might experience changes, usually increases, in certain types of calls in relation to heavy rain and flooding

- Carbon monoxide
- Gasoline
- Water contamination
- Food poisoning
- Bites and stings

Background

Changes in certain types of calls in relation to heavy rain and flooding has been observed with Texas Poison Center Network

- Hurricane Katrina
- Hurricane Rita
- Hurricane Ike

Background

Changes observed by Texas Poison Center network in relation to other weather patterns

- Drought or high temperatures
- Heavy rains after dry spells

As a consequence, DSHS Poison Control Program epidemiologist conducts “environmental surveillance” of particular types of calls

Background

Environmental surveillance: calculation of monthly number of selected types of exposures since January 2000

- Total exposures
- Carbon monoxide
- Gasoline
- Water contamination
- Plants

Background

Environmental surveillance: calculation of monthly number of selected types of exposures since January 2000 (continued)

- Bites and stings: total, scorpions, snakes, spiders
- Pesticides: total, subgroups (insecticides, rodenticides, repellents, etc)

Spreadsheet is distributed to select DSHS programs monthly

Methods

Monthly number of selected environmental exposures reported to Texas Poison Center Network during January-November 2015 from 85 counties in federal disaster declaration was determined

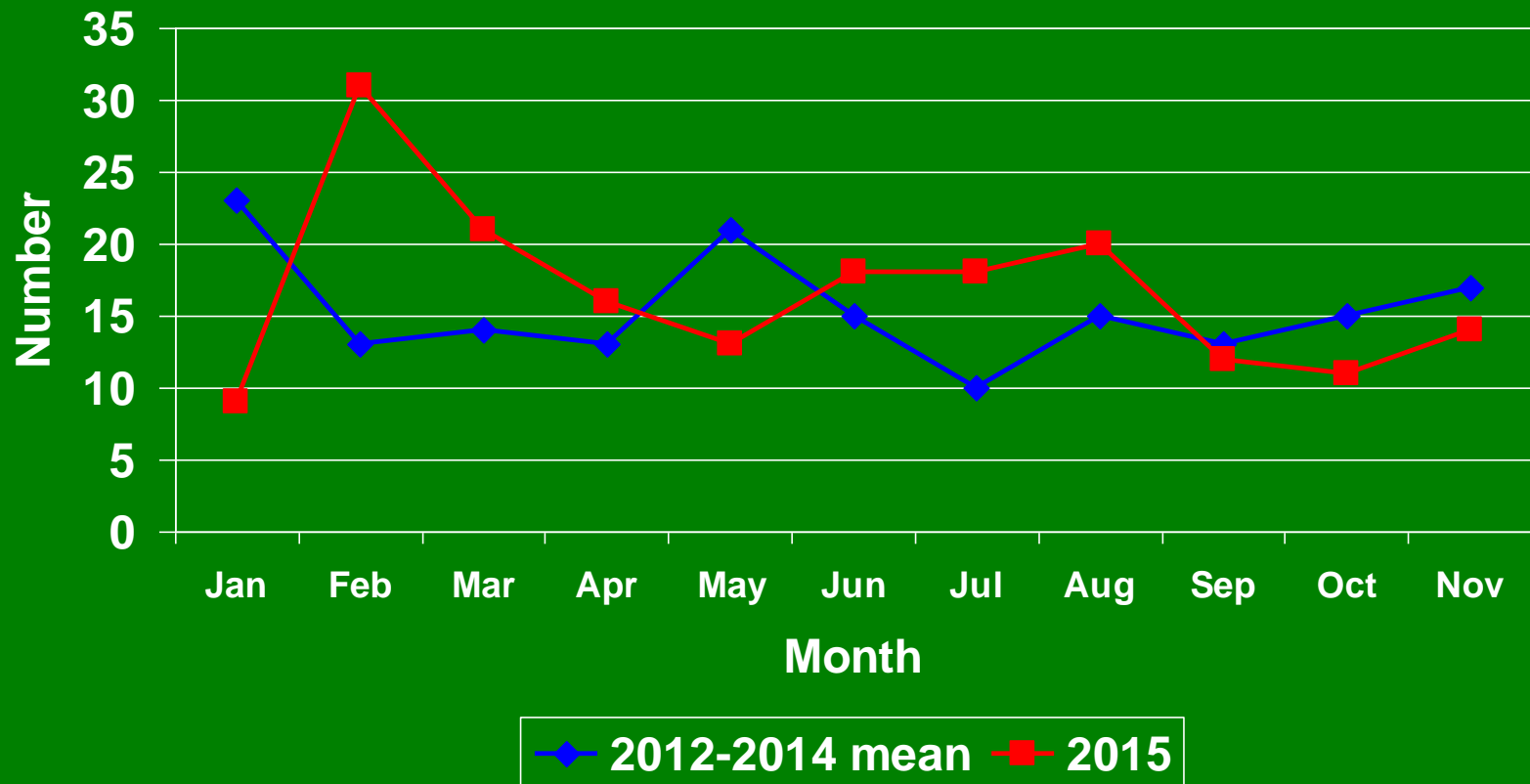
Mean monthly number of same environmental exposures determined for January-November for 2012-2014 from same counties

Methods

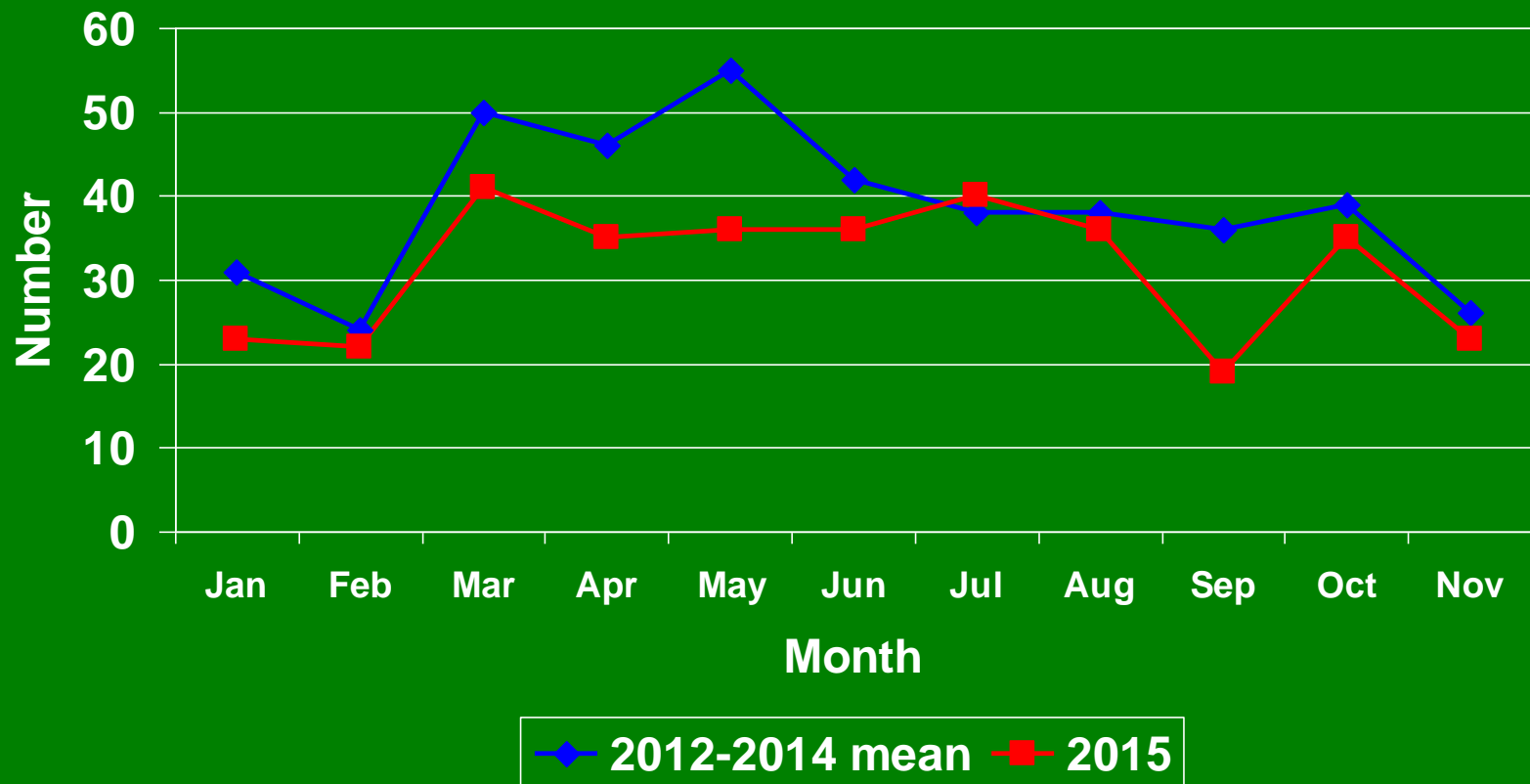
Centers for Disease Control and Prevention
(CDC) conducts surveillance of US poison
center data using 3-year period as reference
Monthly 2015 data compared to mean monthly
2012-2014 data

Results

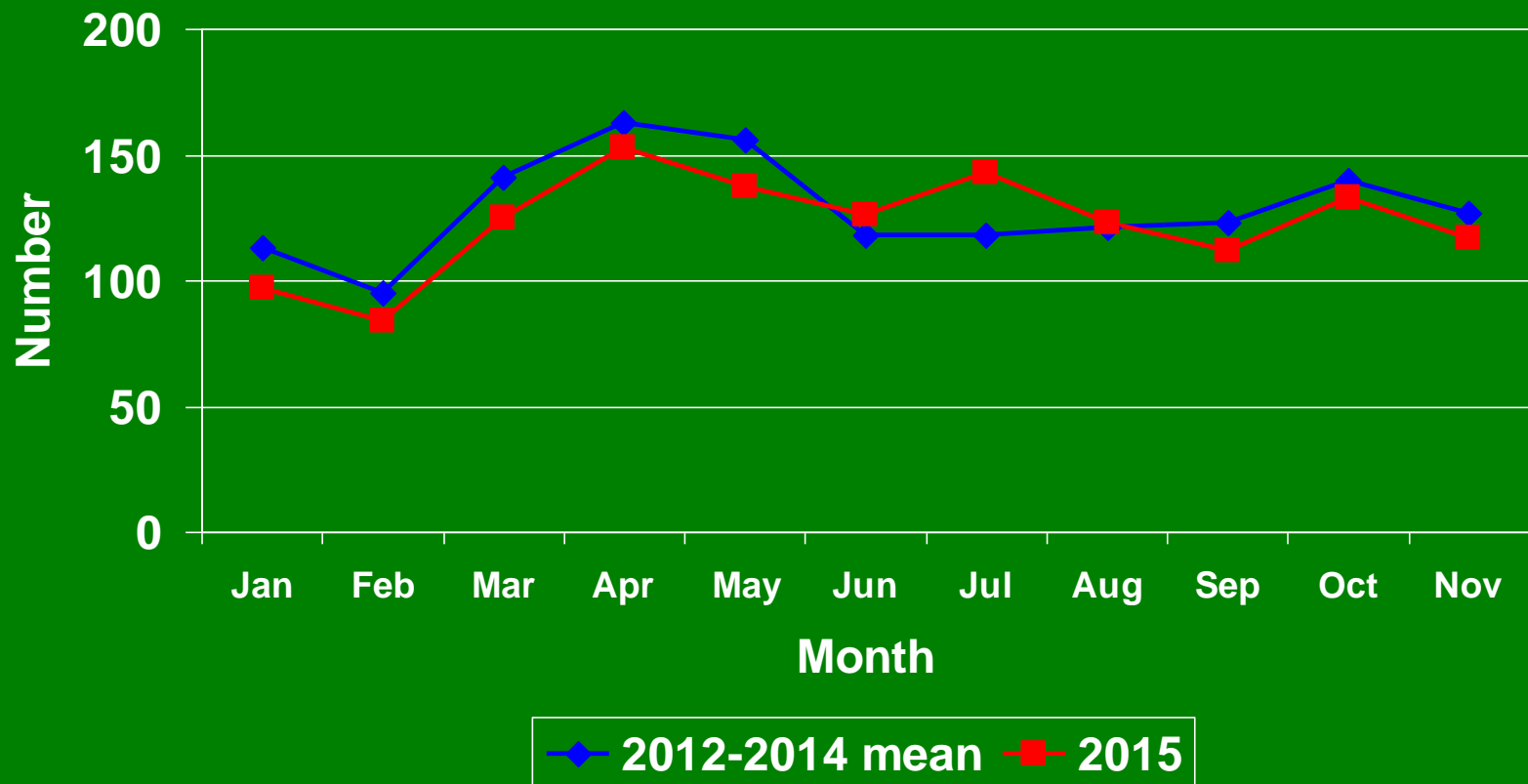
Monthly number of carbon monoxide exposures reported to Texas Poison Center Network



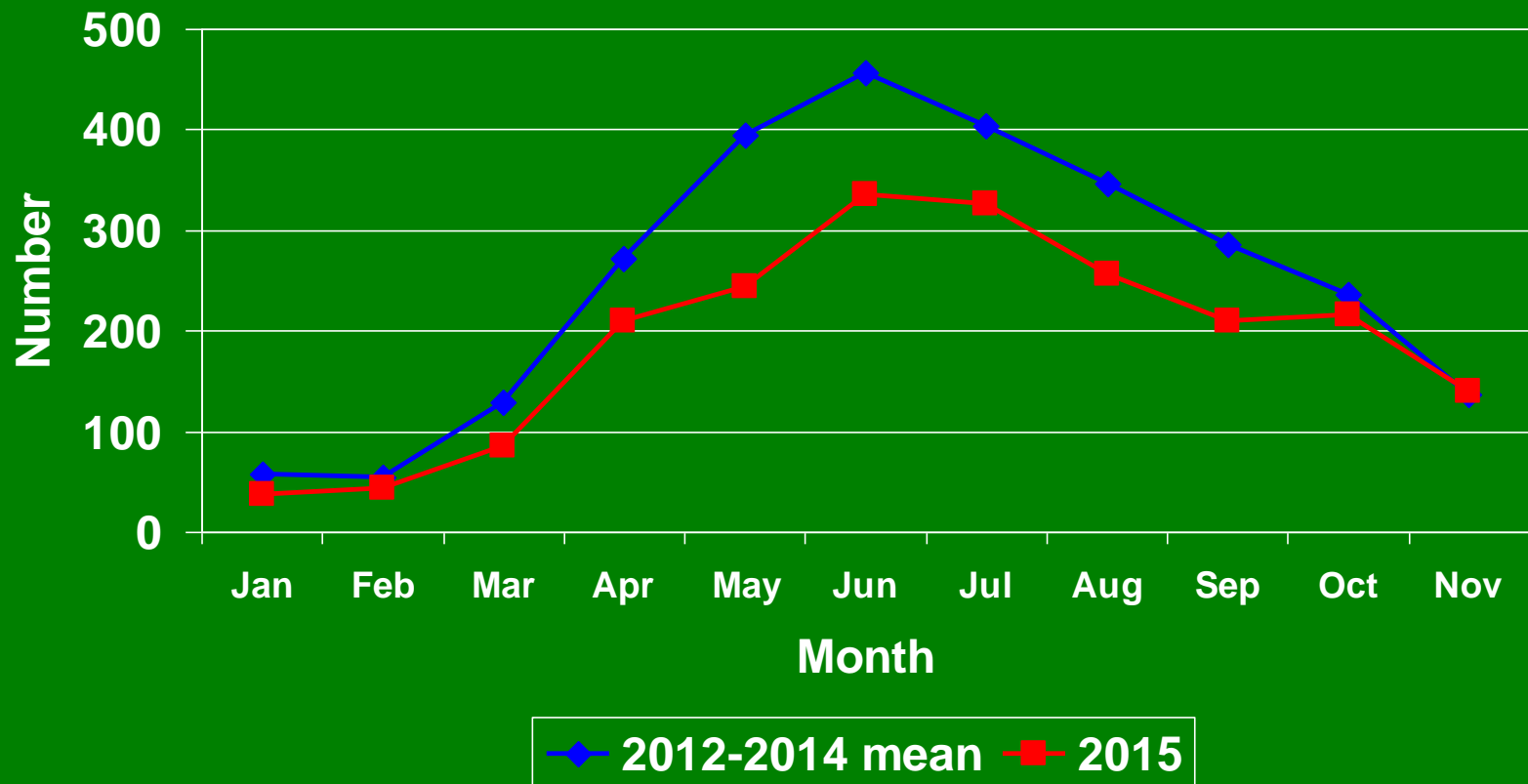
Monthly number of gasoline exposures reported to Texas Poison Center Network



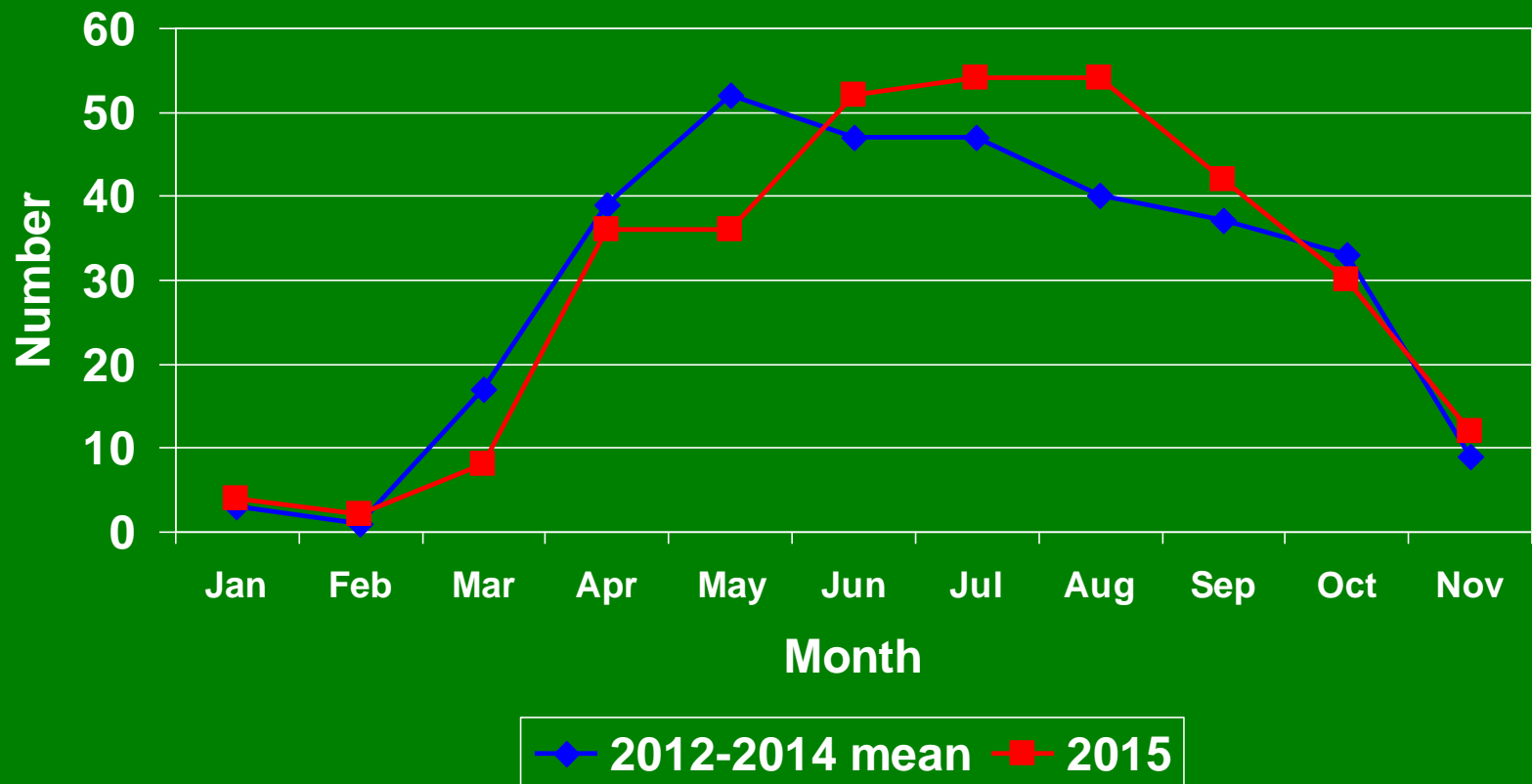
Monthly number of plant exposures reported to Texas Poison Center Network



Monthly number of total bites and stings reported to Texas Poison Center Network

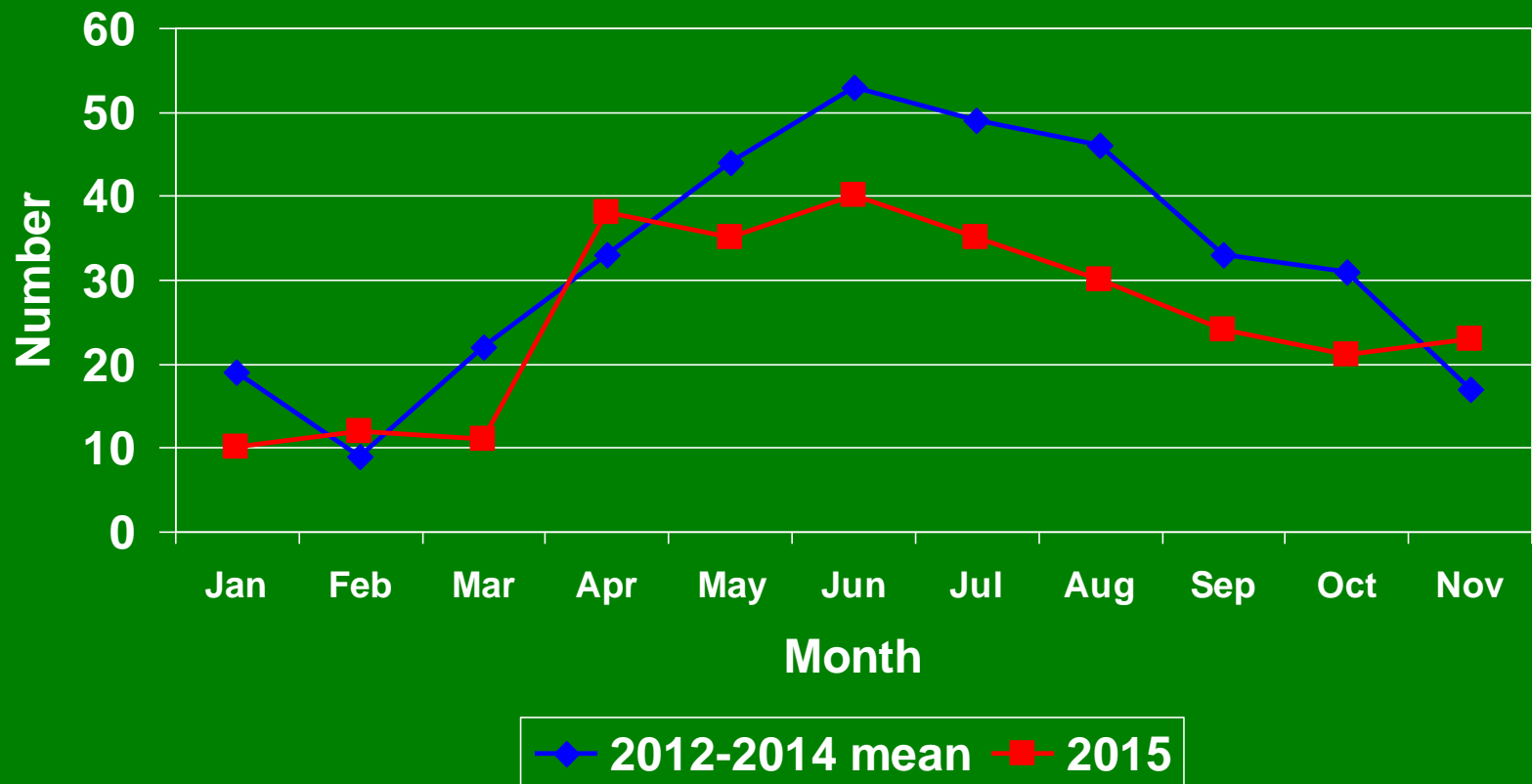


Monthly number of native venomous snake bites reported to Texas Poison Center Network

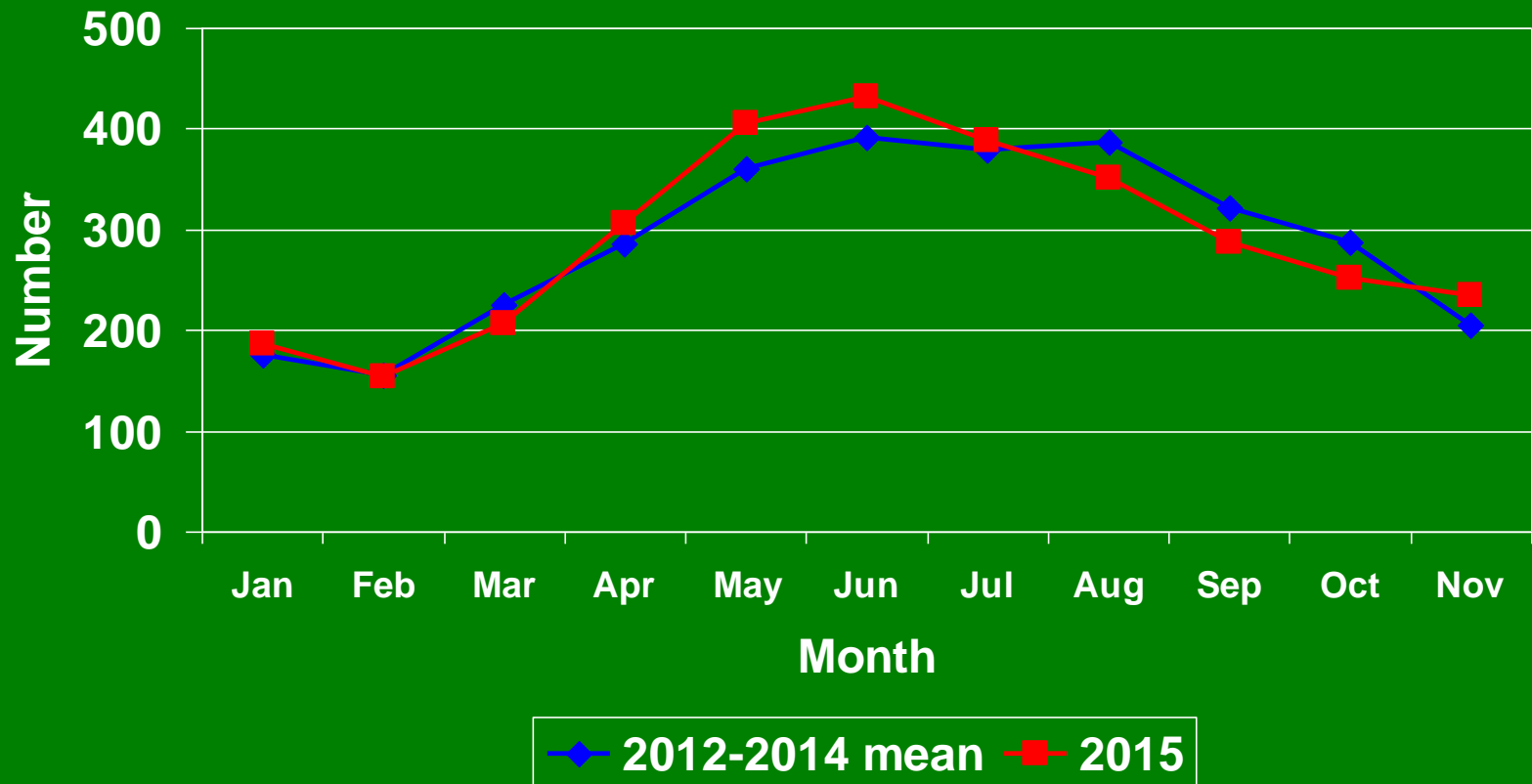


Copperhead, rattlesnake, coral snake, cottonmouth

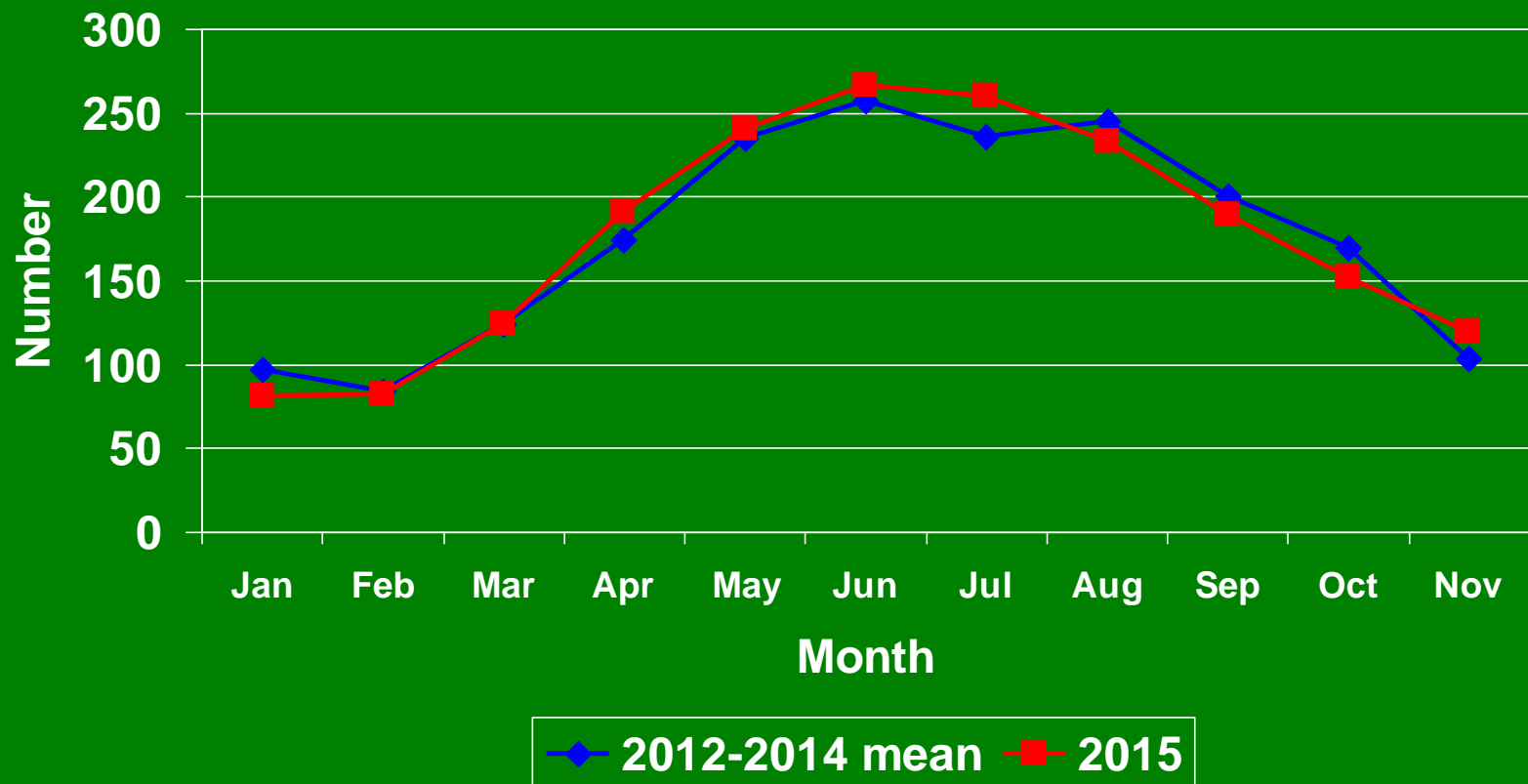
Monthly number of spider bites reported to Texas Poison Center Network



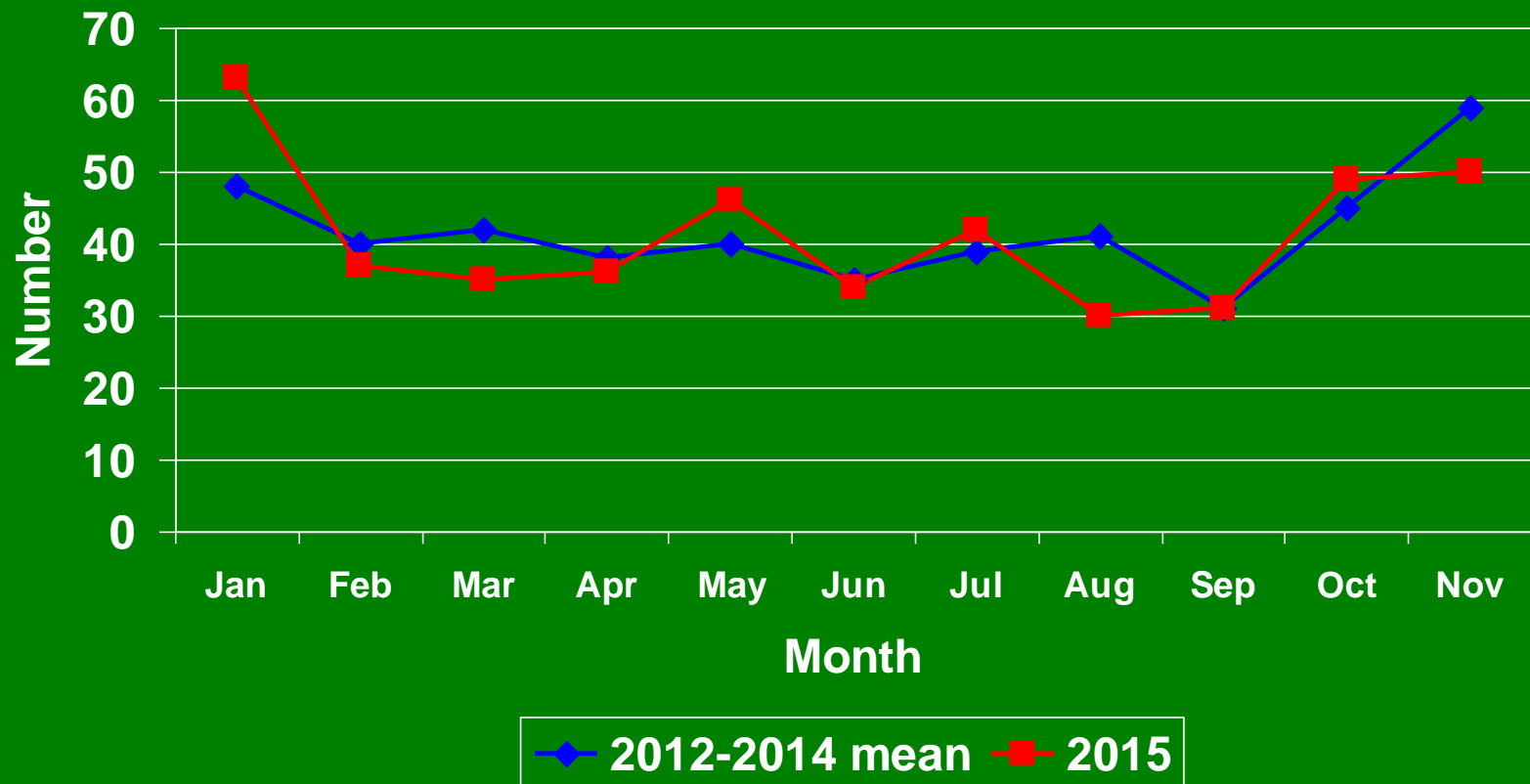
Monthly number of total pesticide exposures reported to Texas Poison Center Network



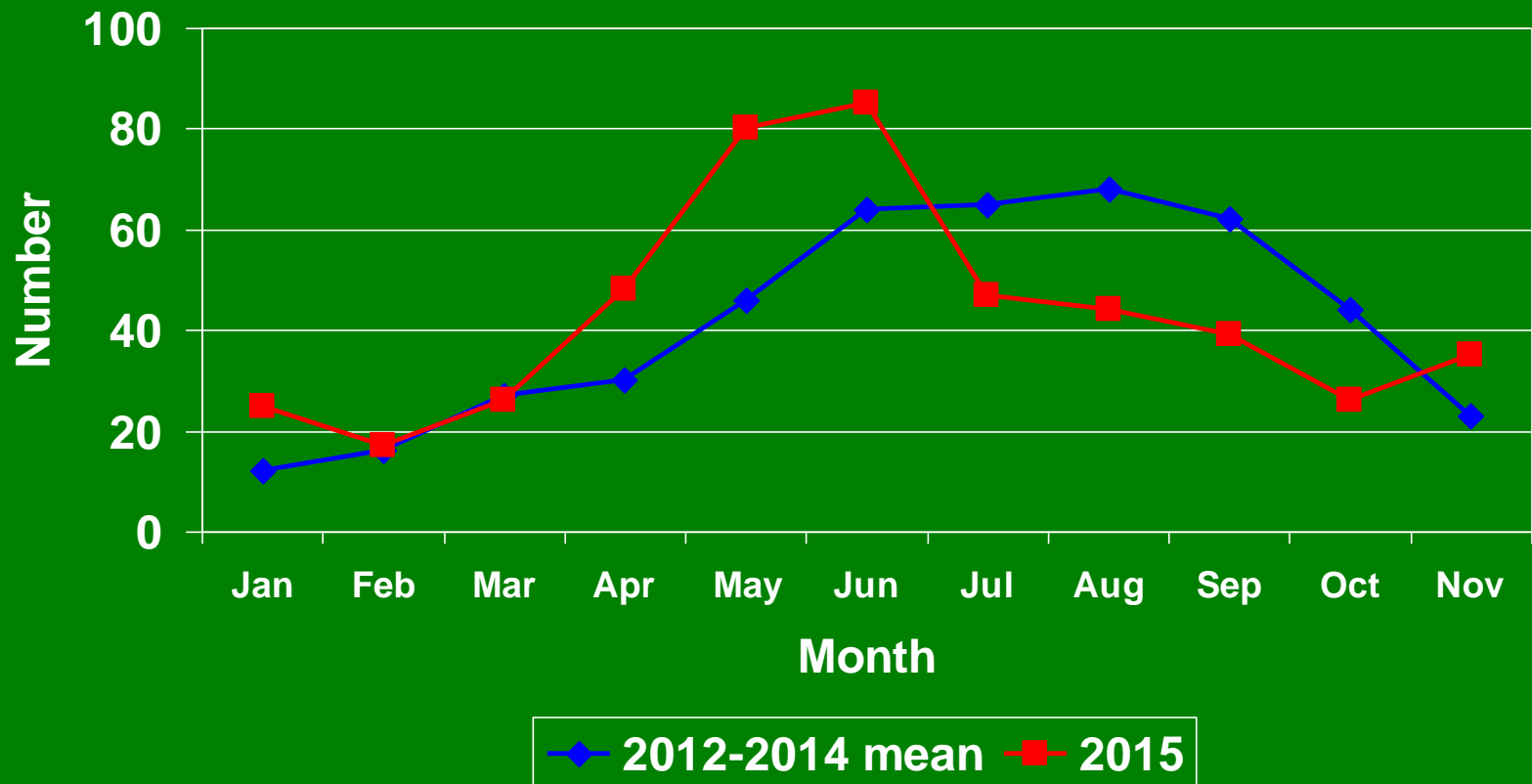
Monthly number of insecticide exposures reported to Texas Poison Center Network



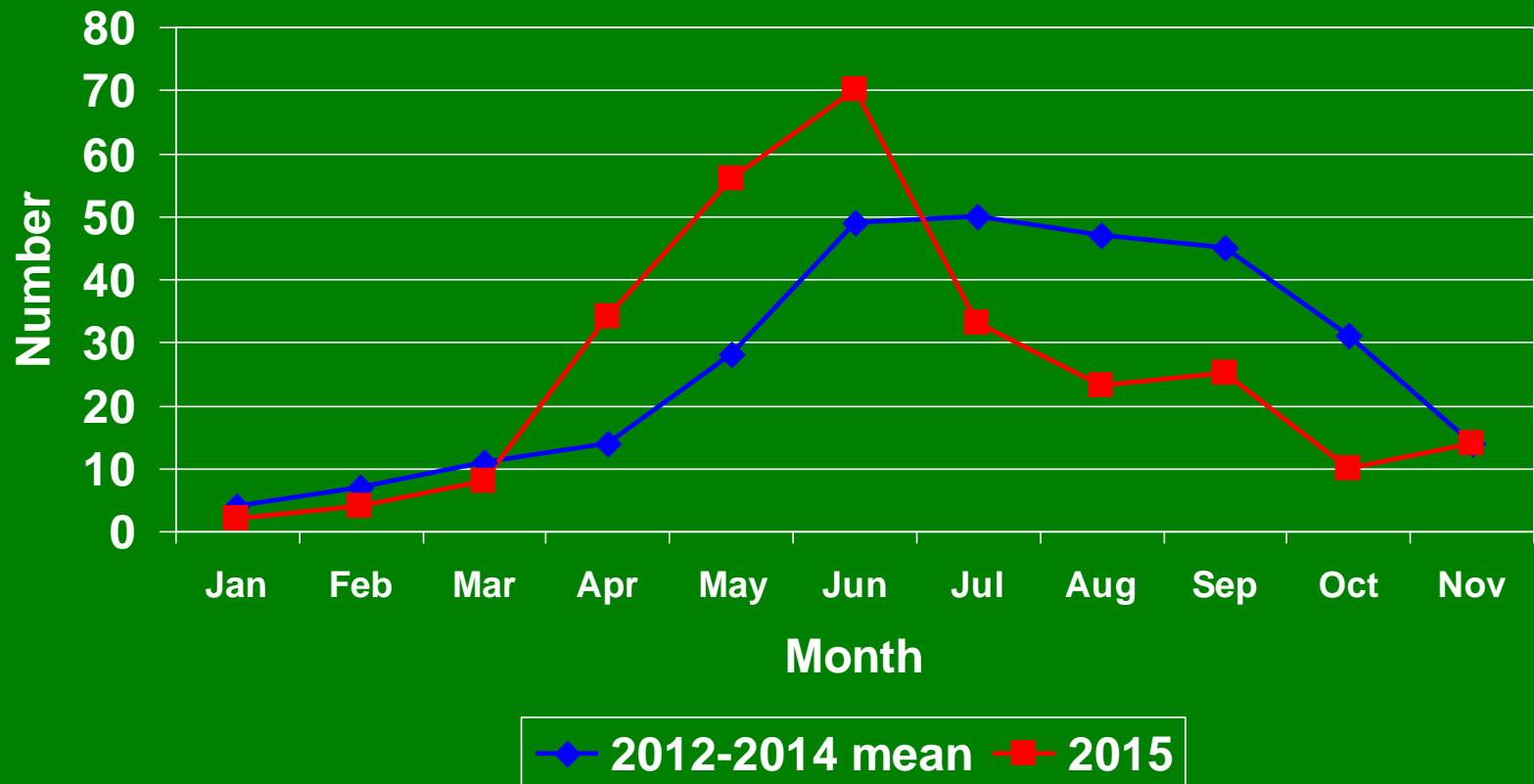
Monthly number of rodenticide exposures reported to Texas Poison Center Network



Monthly number of animal repellent exposures reported to Texas Poison Center Network



Monthly number of insect repellent exposures reported to Texas Poison Center Network



Discussion

Severe rains and flooding did not cause an increase in Texas poison center calls about exposures to carbon monoxide or gasoline, something that has been observed with tropical storms

Storms had no clear impact on reported plant exposures

Discussion

Total reported bites and stings were 38% lower in May 2015 than mean for May 2012-2014

- Lower than for any May going back to 2000
- However, 2015 exposures were lower for every month except November, although percent difference was greatest for May
- Native venomous snake bites were 31% lower in May 2015 than for 2012-2014 mean for corresponding month

Discussion

Bites and stings (continued)

- Contrasts with news media that reported an increase in venomous snake bites seen at North Texas hospitals
- Spider bites lower in May 2015 than for corresponding month 2012-2014 mean, but also lower for June-October

Discussion

Total pesticide exposures were 12% higher in May 2015 than mean for May 2012-2014

- No clear increase for insecticides and rodenticides
- Animal repellents were 75% higher in May 2015 than mean for corresponding month for 2012-2014
 - Corresponding increase was seen for insect repellents
 - Increase was observed for April and June

Discussion

Limitations

- Reporting these exposures to Texas Poison Center Network is voluntary
- Reporting may vary from year to year
- Relatively small monthly numbers for some of the exposures studied: a single multiple-person exposure can skew results
- Counties in federal declaration and not state declaration used: 20% population difference

Conclusions

The heavy rains and flooding in May 2015 appear to have affected:

- The number of reported bites and stings, particularly native venomous snakes
- The number of reported pesticide exposures, particularly animal repellents